

Nicholas Vadivelu

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Experience	Uber ATG • Research Intern Jan 2020 – Aug 2020 <ul style="list-style-type: none">Improved object detection by 90% (AP) and motion forecasting by 22% (L2) of a self-driving neural net under realistic positional error, significantly improving safety for future ridersWrote a first author paper on the learned positional error correction system (under review at CoRL) Google Brain • Software Engineering Intern May 2019 – Aug 2019 <ul style="list-style-type: none">Unlocked K-FAC for over 370,000 users by implementing and open sourcing automatic support for arbitrary neural network architectures and integrating it into the Keras ecosystemEnabled simple multi-node, multi-GPU/TPU training for users by incorporating TensorFlow's Distribution Strategy and efficient distributed operation placementDesigned, created, and open-sourced idiomatic, reproducible training recipes for users while carefully considering hyperparameter ranges, baselines, datasets, and models NVIDIA • Performance Software Engineering Intern Aug 2020 – Present <ul style="list-style-type: none">Optimizing sparse BERT inference performance for TensorRT in C++, enabling a potential 50% reduction in inference time, memory usage, and power usage for customers John Hancock Financial • Data Science Intern May 2018 – Aug 2018 <ul style="list-style-type: none">Achieved a fraud detection rate of 63% through designing an unsupervised ML modelDeployed 25 fraud identifying rules in SQL that correctly flagged 100+ out of 20,000+ claimsWorked closely with clinicians to extract features from 5 new data sources using pandas Sunnybrook Research Institute • Software Developer Intern Jul 2017 – Aug 2017 <ul style="list-style-type: none">Improved MRI segmentation accuracy by up to 80% and reduced time to contour MRI scans from ~5 hrs to ~40 mins by implementing techniques including watershed and clustering
Open Source	PyTorch Ignite : Improved performance by up to 63% by designing and implementing async updates for distributed metrics with tests and documentation
Leadership	Data Science Club Lectures : Designed and presented workshops about neural networks in TensorFlow , machine learning in scikit-learn , and data cleaning in pandas for 300+ students WATonomous Design Team : Implemented real-time object detection in Tensorflow , OpenCV
Projects	Competitive Pokemon Analysis : Scraped, visualized, analyzed, and modeled Pokemon data with random forests, boosting trees, and markov chains in pandas , scikit-learn , and matplotlib Thrive Life Simulator : Created a 3D ray-casting game engine from scratch for a dinosaur world simulation game in Java with object-oriented design and detailed documentation Kaggle - Quora Insincere Questions Competition : Achieved an F1 score of 0.669 using an LSTM with GloVe embeddings after training for the 2-hour limit
Education	University of Waterloo • Computer Science & Statistics (B. Math) 2017 – 2022 Cumulative GPA: 3.94/4.00 - Dean's List <ul style="list-style-type: none">Research (Prof. Lin Tan): Proposed and implemented deep learning methods to identify bugs in codeResearch (Prof. Pascal Poupart): Investigated practical second order optimization methods for NNs